

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MISSOURI
EASTERN DIVISION

A.O.A., <i>et al.</i> ,)	
)	
Plaintiffs,)	Case No. 4:11-cv-00044-CDP
)	(CONSOLIDATED)
vs.)	
)	
THE DOE RUN RESOURCES)	
CORPORATION, <i>et al.</i> ,)	
)	
Defendants.)	

**DEFENDANTS’ MEMORANDUM OF LAW IN SUPPORT OF MOTION TO EXCLUDE
THE PROFFERED OPINION TESTIMONY OF PLAINTIFFS’ EXPERT WITNESS
JILL E. RYER-POWDER, Ph.D., UNDER RULE 702 AND *DAUBERT***

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I. INTRODUCTION

Dr. Ryer-Powder is a toxicologist who intends to testify that Plaintiffs' exposures to lead, arsenic, and sulfur dioxide¹ while growing up in La Oroya were at levels sufficient to cause their alleged injuries or to increase the risk that each Plaintiff will experience health effects in the future.² This is not a new role for her. Dr. Ryer-Powder frequently serves as an expert for plaintiffs in tort litigation. And, notably, her testimony has been excluded at least twice because her opinions have been deemed unreliable. *See C.W. v. Textron, Inc.*, No. 3:10-cv-87-PPS, 2014 WL 1047940 (N.D. Ind. Mar. 17, 2014) (finding that opinions that plaintiffs' exposures were at levels sufficient to cause harm and to present an unacceptable risk of cancer were unreliable and inadmissible), *aff'd*, *C.W. ex rel. Wood v. Textron, Inc.*, 807 F.3d 827 (7th Cir. 2015); *Diamond X Ranch LLC v. Atlantic Richfield Co.*, No. 3:13-cv-00570, 2018 WL 2127734 (D. Nev. May 8, 2018) (expert opinion excluded because no differential diagnosis had been performed). Here, too, her opinions are unreliable and should be excluded under FED. R. EVID. 702 and *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), and its progeny.

First, while Dr. Ryer-Powder's opinions stray from general causation (whether an exposure is capable of causing a particular health endpoint) to specific causation (whether an exposure did cause a plaintiff's health endpoint), she should not be permitted to render specific causation opinions. She is not qualified to do so given she is not a medical doctor. In any event, she did not

¹ As discussed in Defendants' Motion for Summary Judgment, filed concurrently herewith, Plaintiffs' claims based on their alleged exposures to arsenic and sulfur dioxide fail as a matter of law because they have not come forward with expert evidence showing that those exposures caused any of their injuries.

² Dr. Ryer-Powder submitted several reports and addenda, namely: Ex. A, 2/18/19 Report ("Ryer-Powder Rep."); Ex. B, 4/2/19 Addendum to Rep. ("Ryer-Powder Add."); Ex. C, 4/15/19 Appendices; Ex. D, 6/22/20 Rebuttal Report ("Ryer-Powder Reb. Rep."); and Ex. E, 8/6/21 Addendum. She was deposed twice, on 4/5/19 (Ex. F, "4/15/19 Dep."), and on 8/19/20 (Ex. G, "8/19/20 Dep.").

follow the generally accepted methodology to reach specific causation opinions.

Second, Dr. Ryer-Powder's general causation opinions are unreliable as they are based on a highly flawed methodology. The information and studies upon which she relies are not a proper basis to reach the causation opinions she has expressed. For example, she ignores relevant data when she fails to consider alternative sources of lead and arsenic, including the historical lead contamination pre-dating Doe Run Peru's ("DRP") operation of the La Oroya Complex (the "Complex"). Further, her method for determining background blood lead levels ("BLLs") is unreliable because she relies on inapposite studies to arrive at her estimate. She also improperly relies on the seriously flawed air modeling of David Sullivan and modeled BLLs of David MacIntosh without making any effort to verify their accuracy. In addition, she made numerous mathematical and other errors.

Third, some of Dr. Ryer-Powder's opinions are irrelevant and fail *Daubert's* "fit" requirement. She proffers gratuitous opinions about injuries no Plaintiff has alleged to have experienced. Similarly, her opinions regarding Plaintiffs' risk of developing cancer or other health effects from arsenic exposure are irrelevant because, as she has admitted, Plaintiffs are not reasonably certain to develop cancer due to these exposures. Her opinions regarding Plaintiffs' alleged sulfur dioxide exposure and associated risks are also irrelevant as she fails to show that Plaintiffs are reasonably certain to develop any sulfur dioxide-induced health effects.

Finally, Dr. Ryer-Powder's opinions regarding Plaintiffs' alleged lead exposures are needlessly cumulative of and improperly bolster opinions expressed by other experts.

Accordingly, Defendants respectfully request that the Court exclude Dr. Ryer-Powder's expert opinions in their entirety.

II. LEGAL STANDARD

Under *Daubert* and Federal Rule of Evidence 702, a federal district court has a *duty* to act

as a “gatekeeper,” ensuring that only scientifically reliable and relevant expert evidence is presented to the jury. *Daubert*, 509 U.S. at 589. Rule 702 provides that “[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if”:

- (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

In *Johnson v. Mead Johnson & Co., LLC*, 754 F.3d 557, 561 (8th Cir. 2014), the court explained that “[t]he screening requirement of Rule 702 has been boiled down to a three-part test”:

First, evidence based on scientific, technical, or other specialized knowledge must be useful to the finder of fact in deciding the ultimate issue of fact. This is the basic rule of relevancy. Second, the proposed witness must be qualified to assist the finder of fact. Third, the proposed evidence must be reliable or trustworthy in an evidentiary sense, so that, if the finder of fact accepts it as true, it provides the assistance the finder of fact requires.

Id. at 561. “The proponent of the expert testimony must prove its admissibility by a preponderance of the evidence.” *Redd v. Depuy Orthopaedics*, 700 F. App’x 551, 554 (8th Cir. 2017).

“To show that the expert testimony is relevant, the proponent must show that the reasoning or methodology in question is applied properly to the facts in issue.” *Marmo v. Tyson Fresh Meats, Inc.*, 457 F.3d 748, 758 (8th Cir. 2006); *see also Daubert*, 509 U.S. at 591-92 (“Rule 702’s ‘helpfulness’ standard requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility.”); *Lauzon v. Senco Prods., Inc.*, 270 F.3d 681, 687 (8th Cir. 2001) (court must consider “whether the proposed expert sufficiently connected the proposed testimony with the facts of the case”). “Failure to show the reliability of each step in an expert’s methodology is fatal under *Daubert*.” *In re Baycol Prod. Litig.*, 532 F. Supp. 2d 1029, 1042 (D. Minn. 2007).

Moreover, “[e]xpert testimony that is speculative is not competent proof and contributes nothing to a legally sufficient evidentiary basis.” *J.B. Hunt Transp., Inc. v. GMC*, 243 F.3d 441, 444 (8th Cir. 2001).

In *Daubert*, “the Supreme Court set forth four factors to guide district courts in resolving admissibility questions: whether the expert’s methodology has been tested, has been subjected to peer review, has a known or knowable error rate, and is generally accepted in the scientific community.” *Kirk v. Schaeffler Grp. USA, Inc.*, 887 F.3d 376, 391 (8th Cir. 2018). “*Daubert*’s progeny provides additional factors such as: whether the expertise was developed for litigation or naturally flowed from the expert’s research; whether the proposed expert ruled out other alternative explanations; and whether the proposed expert sufficiently connected the proposed testimony with the facts of the case.” *Lauzon*, 270 F.3d at 687. In weighing these factors, the court properly exercises its gatekeeping function by “separat[ing] expert opinion evidence based on ‘good grounds’ from subjective speculation that masquerades as scientific knowledge.” *Glastetter v. Novartis Pharm. Corp.*, 252 F.3d 986, 989 (8th Cir. 2001).

Under this standard, the Court should exclude Dr. Ryer-Powder’s proposed expert testimony.

III. PLAINTIFFS HAVE FAILED TO MEET THEIR BURDEN UNDER *DAUBERT* AND RULE 702 TO SHOW THAT DR. RYER-POWDER IS QUALIFIED AND THAT HER TESTIMONY IS RELIABLE AND RELEVANT TO THE FACTS OF THIS CASE

A. Dr. Ryer-Powder’s specific causation opinions are inadmissible

Plaintiffs designated Dr. Ryer-Powder to provide *general causation* testimony regarding Plaintiffs’ alleged lead, arsenic, and sulfur dioxide exposures and any related health effects or future health risks. “General causation is a showing that the drug or chemical is capable of causing the type of harm from which the plaintiff suffers.” *In re NuvaRing Prods. Liab. Litig.*, Case No. 4:08-MD-1964 RWS, No. 4:08-cv-00558-RWS, 2013 WL 12435800, at *5 n.4 (E.D. Mo. Apr. 10,

2013) (citing *Junk v. Terminix Intern. Co.*, 628 F.3d 439, 450 (8th Cir. 2010)). Indeed, Dr. Ryer-Powder ***initially testified that she was not offering any specific causation opinions.*** Ex. F, 4/5/19 Dep. at 149:7–9. Nonetheless, the opinions in her report are often framed in terms of specific causation. Ex. A, Ryer-Powder Rep. at 8 (“Each Plaintiff was exposed to concentrations of arsenic that directly resulted in an increased risk of cancer and likelihood of adverse effects to skin, the nervous system, and vascular system.”). She also admitted in her rebuttal deposition that “some of [her] opinions [allude] to specific causation.” Ex. G, 8/19/20 Dep. at 17:17–18:11. To the extent Dr. Ryer-Powder proffers any specific causation opinions, those opinions must be excluded.

First, Dr. Ryer-Powder is a toxicologist, not a physician, and is therefore not qualified to diagnose Plaintiffs with any health condition or to offer any expert opinions regarding the specific cause of those alleged conditions in any Plaintiff. *See In re Viagra Prods. Liab. Litig.*, 658 F. Supp. 2d 950, 960 (D. Minn. 2009) (holding that epidemiologist was not qualified to offer a specific causation opinion that Viagra caused the plaintiff’s vision loss because he was “not a medical doctor”).

Second, perhaps because of her lack of qualifications to do so, Dr. Ryer-Powder did not even attempt to perform the differential diagnosis necessary to reach a specific causation determination. “The reliability of a specific causation opinion requires the proffered expert to consider and rule out other likely causes of the plaintiff’s alleged ailment, *i.e.*, to perform a proper differential diagnosis.” *Simon v. Select Comfort Retail Corp.*, No. 4:14-CV-1136, 2016 WL 160643, at *5 (E.D. Mo. Jan. 14, 2016). “A differential etiology rules in plausible causes and then systematically rules out less plausible causes until a most plausible cause emerges.” *Kirk v. Schaeffler Group USA, Inc.*, 887 F.3d 376, 392 (8th Cir. 2018). However, “[w]hen an expert’s differential analysis fails to rule in exposure to the alleged cause at issue (general causation) *and*

fails to rule out other possible causes, the specific causation opinion is not sufficiently reliable and should be excluded.” *Id.* (citing *Bland v. Verizon Wireless, LLC*, 538 F.3d 893, 897–98 (8th Cir. 2008)) (emphasis in original). Here, Dr. Ryer-Powder has not communicated with any Plaintiff, any Plaintiff’s parent, or any Plaintiff’s treating physician nor has she reviewed any Plaintiff’s medical records. Ex. F, 4/5/19 Dep. at 33:16–34:2. She has taken no steps to rule out potential alternative causes for Plaintiffs’ conditions through a differential diagnosis or any other generally accepted methodology.

Since Dr. Ryer-Powder is not qualified to diagnose Plaintiffs with any condition and she has not followed the methodology required to make any such diagnosis, any opinions Dr. Ryer-Powder may have regarding specific causation should be excluded.

B. Dr. Ryer-Powder’s methodology is inherently unreliable

Two separate courts have found that Dr. Ryer-Powder’s methodology is unreliable. In *C.W. v. Textron*, Dr. Ryer-Powder opined that the minor plaintiffs had been exposed to harmful levels of vinyl chloride that caused their present injuries and an increased risk of cancer. 2014 WL 1047940, at *2. The court found that her opinions were unreliable and inadmissible because: (1) she improperly relied on regulatory standards to reach a causation opinion; (2) her dosage calculations overstated plaintiffs’ actual exposure; and (3) she improperly extrapolated from high exposure studies to conclude that the plaintiffs were at an increased risk of cancer. *Id.* at *5-*11.

In *Diamond X Ranch*, the court found that Dr. Ryer-Powder had improperly relied on a witness’s declaration about symptoms he had observed in sheep to reach an opinion that the sheep had died as a result of alleged exposure to hazardous substances. 2018 WL 2127734, at *13. The court explained that reliance on the declaration alone was insufficient: “While a differential diagnosis in sheep is likely different from that in humans, indicia of reliability in determining the cause of symptoms include actual physical examination and laboratory tests, neither of which

occurred here.” *Id.* at *14. The court therefore found that that the declaration and the expert testimony that relied on it were unreliable. *Id.*

Dr. Ryer-Powder’s opinions here suffer from many of the same deficiencies. In addition, her testimony demonstrates a lack of mastery of basic toxicological concepts as well as a level of carelessness that are inconsistent with what one would expect from an expert in their field.

1. Dr. Ryer-Powder disregards potential alternative sources of Plaintiffs’ alleged exposure to lead and arsenic

When assessing the reliability of an expert’s methodology, courts consider “[w]hether the expert has adequately accounted for obvious alternative explanations.” FED. R. EVID. 702 advisory committee’s note (citing *Claar v. Burlington N.R.R.*, 29 F.3d 499, 502 (9th Cir. 1994)); *see also Lauzon*, 270 F.3d at 687. In arriving at her causation opinions in this case, Dr. Ryer-Powder cherry-picks the data and ignores potential alternative sources of lead and arsenic exposure, including the significant historical contamination discussed in reports upon which Dr. Ryer-Powder purports to rely.³

It cannot be disputed that despite DRP’s efforts to reduce lead emissions, the Plaintiffs would still have elevated BLLs “due to the fact that dust and soil in La Oroya will still have high residual concentrations of lead from historical emissions.” Ex. H, Integral 2005 at 129; *see also* Ex. I, Integral 2008 at 2-7. The historical soil and dust contamination in La Oroya causes the local population to be exposed to lead through multiple pathways, including resuspension of lead-contaminated soil by wind, consumption of food products grown in lead-contaminated soils, and

³ These reports include ones prepared by Integral Consulting, who DRP retained to perform extensive sampling and detailed risk assessments in La Oroya. Integral, *Human Health Risk Assessment Report: La Oroya Metallurgical Complex* (“Integral 2005”), relevant pages attached as Ex. H (2005); Integral, *Complementary Human Health Risk Assessment: La Oroya Metallurgical Complex* (“Integral 2008”), relevant pages attached as Ex. I.

inhalation and ingestion of dust from contaminated adobe used in home construction. *See* Ex. J, Report of Dr. Teresa Bowers (“Bowers Rep.”) at 6–7.⁴ Other sources of lead included lead-based gasoline, which was not banned in Peru until 2004, some 30 years after it was phased out in the United States and seven years after DRP acquired the Complex. *Id.* at 8. Lead paint continued to be a significant source of exposure well into the 2000s: a 2006 study found that paints purchased in La Oroya contained lead levels far exceeding acceptable levels. *Id.* Dr. Ryer-Powder purports to rely on the Integral reports to support her opinions, but she ignores all data about potential alternative sources of lead discussed in those reports. *See* Ex. A, Ryer-Powder Rep. at 5. Similarly, there are other potential alternative sources of arsenic exposure that Dr. Ryer-Powder ignored, which are unrelated to DRP’s operation of the Complex, including contaminated dust, adobe construction materials, and drinking water. Ex. J, Bowers Rep. at 33 (citing Integral 2005 & 2008). Dr. Ryer-Powder, however, fails to consider any of these additional sources.

When an expert cherry-picks data and ignores relevant facts, as Dr. Ryer-Powder has done here, that opinion is inadmissible. *See Barber v. United Airlines, Inc.*, 17 Fed. Appx. 433, 437 (7th Cir. 2001) (“Because in formulating his opinion Dr. Hynes cherry-picked the facts he considered to render an expert opinion, the district court correctly barred his testimony because such selective use of facts fails to satisfy the scientific method and *Daubert*.”). Accordingly, Dr. Ryer-Powder’s general causation opinions regarding Plaintiffs’ alleged lead and arsenic exposures are unreliable and inadmissible.

⁴ Integral sampling showed very high levels of lead in an adobe brick in a La Oroya home, demonstrating that the bricks used to build many homes in the area—made from local lead-contaminated soil—are also a potentially significant source of exposure. Ex. J, Bowers Rep. at 6–7.

2. Dr. Ryer-Powder’s method for determining background blood lead levels is unreliable

As discussed above, a significant amount of the lead present in the environment around La Oroya—and the resulting elevated BLLs—is attributable to decades of historical emissions from the Complex before DRP even acquired it in October 1997. As even Plaintiffs’ experts recognize, any causation opinion must account for the background BLLs in La Oroya absent any lead emissions from DRP. *See, e.g., LaBauve v. Olin Corp.*, 231 F.R.D. 632, 646 & 646 n.26 (S.D. Ala. 2005) (“In interpreting the test results for these samples ... it is necessary to place them in context by comparing them to background ... values [T]he data ... has meaning vis à vis [the defendant’s] activities only if compared to the appropriate background level.”); *McMunn v. Babcock & Wilcox Power Generation Grp., Inc.*, 131 F. Supp. 3d 352, 399 (W.D. Pa. 2015) (“Plaintiffs still must demonstrate that they ... inhaled uranium from the [defendant’s] plant in excess of normal background radiation amounts. Otherwise, they cannot demonstrate causation.”). Failure to use a reliable methodology to estimate background levels is ground for exclusion. *See Jones v. Novartis Pharma. Corp.*, 235 F. Supp. 3d 1244, 1280 (N.D. Ala. 2017) (“an *unreliable* application of a background risk methodology leads to the same result as a failure to consider the background risk at all: the expert’s opinion will be excluded”) (emphasis in original).

Dr. Ryer-Powder, however, fails to use a reliable methodology to calculate background BLLs by relying on inapposite studies. Background BLLs differ across communities and across time depending on many factors. According to Dr. Ryer-Powder, to estimate the background level, “you use whatever evidence or literature you have available regarding studies of the parameter you’re interested in ... in areas as similar as you can get without the presence ... of the particular exposure medium you’re looking at.” Ex. F, 4/5/19 Dep. at 63:23–64:4. Dr. Ryer-Powder stated that the “exposure medium” at issue was “the smelter.” *Id.* at 64:4. In searching for studies to

calculate background BLLs, Dr. Ryer-Powder intentionally selected and relied on studies involving communities that were not near a smelter and had no nearby lead-related industries. Ex. A, Ryer-Powder Rep. at 8 n.2; Ex. F, 4/5/19 Dep. at 67:15–24. Thus, these studies differ from La Oroya in at least one highly material way: not one of these studies involves a community with historical lead contamination. Dr. Ryer-Powder’s decision to disregard the impact of this historical contamination as part of her background BLL analysis not only leads to a significantly inaccurate estimate of background BLLs in La Oroya by design, but also overestimates DRP’s alleged contributions to Plaintiffs’ BLLs.

Notably, Dr. Ryer-Powder’s background BLL opinion is inconsistent with the opinions of Plaintiffs’ other expert, David MacIntosh, both in methodology and outcome. Dr. Ryer-Powder and Dr. MacIntosh rely on different studies of different communities. Using two studies involving four communities, one before the ban of leaded gasoline and one after, Dr. Ryer-Powder concludes that before the ban of leaded gasoline, the background BLL in La Oroya would have been between 7.1 and 9.6 $\mu\text{g/dL}$, respectively. Ex. A, Ryer-Powder Rep. at 21. After the ban, she estimates background BLLs would have been 8.7 $\mu\text{g/dL}$. *Id.* Dr. MacIntosh, on the other hand, concluded that the background BLL was 5 $\mu\text{g/dL}$ before the leaded gasoline ban and 2 $\mu\text{g/dL}$ after. Given the importance of reliably establishing background exposure, the discrepancies between these values are significant. If nothing else, this inconsistency demonstrates how unreliable Plaintiffs’ experts’ methodologies are.

3. Dr. Ryer-Powder’s risk assessment opinions are unreliable

Dr. Ryer-Powder purports to estimate each Plaintiff’s exposure to arsenic and their associated risk of developing cancer. Ex. A, Ryer-Powder Rep. at 8. Relying on her model, she concludes that Plaintiffs have experienced an “increased ... likelihood of adverse effects to skin, the nervous system, and the vascular system.” *Id.* Her opinions suffer from many methodological

flaws that render them unreliable and inadmissible.

First, when estimating Plaintiffs' arsenic exposures, Dr. Ryer-Powder makes assumptions based on Mr. Sullivan's air modeling (Ex. A, Ryer-Powder Rep. at 33) and ignores available data that more accurately reflects Plaintiffs' arsenic exposure. There have been several studies of urinary arsenic in the La Oroya area, including a sample from one of the Plaintiffs, all of which "are below regulatory levels and are not expected to be associated with adverse health effects."⁵ Ex. K, Report of Dr. Barbara Beck ("Beck Rep.") at 29. Urine arsenic levels are more accurate than modeled air levels when assessing Plaintiffs' risks of various health effects. *Id.* Yet, Dr. Ryer-Powder ignores this evidence. An expert's "failure to address ... contrary data renders [the opinion] inherently unreliable." *Sanchez v. Bos. Sci. Corp.*, No. 2:12-cv-05762, 2014 WL 4851989, at *11 (S.D. W. Va. Sept. 29, 2014) (expert testimony inadmissible when report failed to account for contrary publications because "a reliable expert would not ignore contrary data"); *Buzzerd v. Flagship Carwash of Port St. Lucie, Inc.*, 669 F. Supp. 2d 514, 523 (M.D. Pa. 2009) (finding that expert's "failure to reassess his opinion in light of actual test results is 'the antithesis of good science'" (quoting *In Re TMI Litig.*, 192 F.3d 613, 676 (3d Cir. 1999))). Dr. Ryer-Powder's failure to consider available data renders her opinions unreliable. *Compare Diamond X Ranch*, 2018 WL 2127734, at *14 (holding that Dr. Ryer-Powder's opinions, proffered without any test data, was unreliable and inadmissible).

Second, Dr. Ryer-Powder's risk assessment relies on EPA's Regional Screening Level ("RSL") for arsenic. The EPA's RSLs are regulatory values developed using default, U.S.-based exposure assumptions, without adjusting for site-specific or Plaintiff-specific parameters. Ex. J,

⁵ The urine sample belonged to Plaintiff D.F.G.C. An additional urine sample belonged to S.A.C.O., who used to be part of this Cohort but has since been dismissed.

Bowers Rep. at 31-32. These U.S. values are irrelevant to the exposures of these Plaintiffs in La Oroya, as they are generic values that represent conditions for long-term exposure at an upper percentile of the population. *Id.* at 35. As Dr. Bowers explained, each Plaintiff is likely to have different contact rates and exposure frequencies, but Dr. Ryer-Powder did not calculate those individual risks based on their individual circumstances, but rather used high exposure RSL assumptions. *Id.* Accordingly, “it is likely that many, if not all, of [Plaintiffs’] individual risks are overestimated.” *Id.* Even if they were applicable to Plaintiffs’ circumstances – which they are not – Dr. Ryer-Powder’s reliance on these regulatory standards renders her opinions inherently unreliable. As the court ruled when excluding her testimony in *Textron*, “reliance on regulatory standards ... is an improper basis for an expert opinion, for mere exposure to toxins in excess of regulatory levels is insufficient to establish causation.” *Textron*, 2014 WL 1047940, at *5.⁶

Further, Dr. Ryer-Powder’s calculation of the total cancer risk for the population of La Oroya is flawed. Specifically, Dr. Ryer-Powder adds (i) the background risk of developing cancer for Peru, which she characterizes as the “risk of getting cancer in Peru before age 75,” and (ii) risk estimates previously calculated by Integral. Ex. A, Ryer-Powder Rep. at 31. However, these are two different kinds of risk that cannot be added together. The value that Dr. Ryer-Powder uses as the total cancer risk for Peru is a “population-based risk, which is based on cancer incidence,” while the Integral “risk” estimate is based on a regulatory risk assessment paradigm. Ex. J, Bowers Rep. at 36. While both are called “risk,” they actually are unrelated concepts that cannot be added. By adding them, Dr. Ryer-Powder significantly overestimates the alleged risk of developing

⁶ Dr. Ryer-Powder also improperly relied on regulatory standards in connection with her sulfur dioxide opinions. She opined that Plaintiffs were exposed to sulfur dioxide concentrations higher than EPA’s National Ambient Air Quality Standards. Ex. A, Ryer-Powder Rep. at 44-45. Her reliance on these regulatory standards also renders those opinions unreliable and inadmissible.

cancer due to arsenic exposure from the Complex's emissions. The value that Dr. Ryer-Powder uses as the background cancer risk is the cancer incidence rate in Peru from 2008. As such, to the extent anyone in La Oroya had cancer due to arsenic exposure from the Complex's emissions in 2008, that individual was already included in the 2008 cancer incidence rate for Peru. Ex. G, 8/19/20 Dep. at 61:9–12. Therefore, by adding these values, Dr. Ryer-Powder ***double counts*** any arsenic-associated cancer risk in La Oroya.

Another error is that Dr. Ryer-Powder relied on an outdated cancer risk assessment model developed by EPA that is inconsistent with arsenic's mode of toxicity and that overestimates any associated cancer risks. *See* Ex. A, Ryer-Powder Rep. at 28; *see also* Ex. K, Beck Rep. at 51 (explaining that the values Dr. Ryer-Powder used were based on "EPA's analysis for [arsenic] last updated in 1995"). These values were derived from EPA's "default" approach of using a linear dose-response relationship meant to offer "conservative" estimates of carcinogenicity to meet the regulatory objectives of protecting human health, but that do not prove causation. *Id.*; *cf. Textron*, 2014 WL 1047940, at *5 ("regulatory agencies are charged with protecting public health and thus reasonably employ a lower threshold of proof in promulgating their regulations than is used in tort cases") (citing *Baker v. Chevron USA, Inc.*, 680 F. Supp. 2d 865, 880 (S.D. W. Va. 2010); *Allen v. Pa. Eng'g Corp.*, 102 F.3d 194, 199 (5th Cir. 1996)). "[B]ased on a more current understanding of the carcinogenic process, many scientists today have concluded that this [linear dose-response] model is likely to overestimate cancer risk for many chemicals." Ex. K, Beck Rep. at 51. This is particularly true for arsenic, as recent evidence shows that the dose-response relationship between arsenic and cancer is non-linear. *Id.* Dr. Ryer-Powder argues that the 1995 guidance is the most current guidance from EPA and is, thus, appropriate for this kind of health risk assessment. Ex. D, Ryer-Powder Reb. Rep. at 16. However, this argument fails to respond to the criticism that EPA's

approach overestimates the cancer risk associated with arsenic.

4. Dr. Ryer-Powder's methodology for estimating Plaintiffs' alleged sulfur dioxide exposures to and associated risk of injury is unreliable

Dr. Ryer-Powder's assessment of Plaintiff-specific sulfur dioxide exposures and concomitant risks of injury are also unreliable. As mentioned above, Dr. Ryer-Powder bases her sulfur dioxide exposure assessment entirely on Mr. Sullivan's flawed air modeling. *See* Ex. A, Ryer-Powder Rep. at 44–45 (using Mr. Sullivan's air modeling to estimate Plaintiffs' SO₂ exposure); Ex. F, 4/5/19 Dep. at 136:7–19 (acknowledging that she made no calculations but that the “values are again pulled off of Mr. Sullivan's tables”). Dr. Ryer-Powder took no steps to verify or validate the reliability of Mr. Sullivan's work. Ex. F, 4/5/19 Dep. at 53:22–54:2. Mr. Sullivan's air modeling and sulfur dioxide exposure estimates are fatally flawed and unreliable for a variety of reasons. Thus, if Mr. Sullivan's air modeling and sulfur dioxide testimony is excluded or limited, Dr. Ryer-Powder's testimony regarding her sulfur dioxide assessment should be excluded or limited as well. *See Junk*, 628 F.3d at 449.

Moreover, Dr. Ryer-Powder's assertion that Plaintiffs are likely to experience long-term effects due to their alleged sulfur dioxide exposure is inconsistent with more recent research on the topic. Dr. Ryer-Powder cites the 1998 Agency for Toxic Substances and Disease Registry (“ATSDR”) Toxicological Profile for Sulfur Dioxide in support of her conclusion that “[c]hildren who have inhaled sulfur dioxide may develop more breathing problems as they get older, make more emergency room visits for wheezing fits, and may get more respiratory illness than other children.” Ex. A, Ryer-Powder Rep. at 35. But EPA's 2017 Integrated Science Assessment for Sulfur Oxides concluded that there was insufficient or inadequate evidence to infer a causal relationship between long-term sulfur dioxide exposures and chronic respiratory effects. Ex. K, Beck Rep. 11/26/19 at 52. Dr. Ryer-Powder fails to cite or even consider the most recent, generally

accepted scientific publications, relying instead on outdated publications. *Cf. Textron*, 2014 WL 1047940, at *5 (criticizing Dr. Ryer-Powder's reliance on an ATSDR report) (citing *LeBlanc v. Chevron USA, Inc.*, 396 Fed. Appx. 94, 100 (5th Cir. 2010)).

5. Dr. Ryer-Powder makes numerous other errors

Overall, Dr. Ryer-Powder's work is sloppy and riddled with careless mistakes, including calculation errors, errors in applying various assumptions, and input errors. These errors in their totality demonstrate a level of carelessness in Dr. Ryer-Powder's work that is inconsistent with the work of an expert in her field.

Dr. Ryer-Powder has repeatedly demonstrated that she ***does not understand*** several key concepts and terms that a qualified risk assessor should know. For example, Dr. Ryer-Powder relies extensively on Integral's risk assessments and calculations but her deposition testimony makes clear that she did not understand several key aspects of Integral's methodology: she incorrectly stated that Integral used an inhalation unit risk in their arsenic risk assessment (Ex. F, 4/5/19 Dep. at 100:1–19); she struggled to explain how Integral used relative absorption factors and incorrectly described a relative absorption factor as corresponding to lung absorption even though it refers only to absorption in the gastrointestinal system (Ex. F, 4/5/19 Dep. at 102:2–103:18); and, when asked about converting sulfur dioxide concentrations from parts per million (“ppm”) to $\mu\text{g}/\text{m}^3$, she was unable to recall the equation $PV = nRT$, a formula that is taught in high school physics and chemistry classes for this very purpose.

Dr. Ryer-Powder also applies assumptions inconsistently and makes several other errors when calculating Plaintiffs' arsenic-associated cancer risks. For example, to build her cancer risk assessment, Dr. Ryer-Powder assumed that each child spent two-thirds of the day at home and one-third of the day at school. Ex. A, Ryer-Powder Rep. 2/18/19 at 32. But for the years when Plaintiffs were not attending school, Dr. Ryer-Powder applies this assumption inconsistently. For

some Plaintiffs, she assumed that if the Plaintiff was not at school, they were at home for the whole day. For other Plaintiffs, however, she assumed that they were at home for two-thirds of the day but received no exposure for the remaining one-third of the day. Ex. K, Bowers Rep. at 32. In addition, for Plaintiff N.K.C.V., Dr. Ryer-Powder includes an air arsenic exposure value in 2001, even though this Plaintiff was not born until 2004. *Id.* Dr. Ryer-Powder acknowledged this as an error in her first deposition (Ex. F, 4/5/19 Dep. at 122:18-123), but failed to correct it in any of her later reports. Similarly, she assumes a full year of arsenic exposure for Plaintiff R.L.E.Y. in 2001 even though he was not born until August 2001. *Id.* at 124-125. Finally, for Plaintiff D.F.G.C., she assumed an incorrect residential address. *Id.* at 126-127. All of these errors lead to an overestimate of the various Plaintiffs' arsenic exposures and concomitant cancer risks – and provide additional evidence of the sloppiness of Dr. Ryer-Powder's work.

Dr. Ryer-Powder committed yet another error when converting sulfur dioxide concentrations from ppm to $\mu\text{g}/\text{m}^3$. She claims to have assumed EPA normal standard temperature (25°C) and pressure (14.7 pounds per square inch, psi) (Ex. A, Ryer-Powder Rep. at 35), but instead utilized a standard temperature of 0°C and a pressure of 14.5 pounds per square inch, resulting in a higher sulfur dioxide concentration than would have resulted if she used the values she claimed to have used. Ex. K, Bowers Rep. at 34. Finally, Dr. Ryer-Powder assigns multiple Plaintiffs to incorrect receptors, resulting in higher SO₂ exposures. *Id.* at 34–35.

These errors and flaws, individually and in the aggregate, demonstrate without a doubt that Dr. Ryer-Powder's methodology is unreliable. Her opinions should be excluded in their entirety.

C. Dr. Ryer-Powder's opinions regarding injuries Plaintiffs have not alleged to have experienced or that are not actionable are irrelevant

Dr. Ryer-Powder proffers opinions about a long list of physical conditions that no Plaintiff alleges (e.g., injuries related to kidneys (including “tubular dysfunction”), bones (including

osteoporosis), or immune systems). Similarly, Plaintiffs have failed to come forward with expert evidence that shows Plaintiffs have any injuries caused by their alleged exposures to arsenic or sulfur dioxide. Opinion testimony regarding conditions not at issue in the case are irrelevant and inadmissible. *See C.C. v. Suzuki Mfg. of Am. Corp.*, No. 4:1-cv-1271, 2018 WL 3861354, at *9 (E.D. Mo. Aug. 14, 2018) (holding that expert’s testimony regarding helmet use “is irrelevant because there are no alleged brain injuries”); *see also Carmichael v. City of New York*, 34 F. Supp. 3d 252, 265 (E.D.N.Y. 2014) (“Expert testimony that is not probative of a fact in issue is irrelevant and inadmissible”) (citing *Fashion Boutique of Short Hills, Inc. v. Fendi USA, Inc.*, 314 F.3d 48, 60 (2d Cir. 2002)).

In addition to cancer, Dr. Ryer-Powder concludes that Plaintiffs’ alleged exposure to arsenic has increased their likelihood of developing certain non-cancer conditions related to the skin, vascular system, and nervous system. Once again, Dr. Ryer-Powder’s opinions are irrelevant because she makes no attempt to quantify Plaintiffs’ individual likelihood of having or developing any of these alleged arsenic-associated non-cancer health effects. Instead, based entirely on Mr. Sullivan’s estimate of Plaintiffs’ air arsenic exposures, Dr. Ryer-Powder asserts that each Plaintiff was exposed to sufficient arsenic to experience these health effects. Ex. A, Ryer-Powder Rep. 2/18/19 at 8. As such, Dr. Ryer-Powder fails to conclude that any Plaintiff is *more likely than not* to develop any particular non-cancer condition as a result of arsenic exposure. *See Thomas v. FAG Bearings Corp. Inc.*, 846 F. Supp. 1400, 1408 (W.D. Mo. 1994); *see also Lesch*, 612 F.3d at 982. Thus, Dr. Ryer-Powder’s opinions regarding Plaintiffs’ risks of developing non-cancer health effects are nonprobative and irrelevant.

Dr. Ryer-Powder’s opinions regarding Plaintiffs’ risks of developing symptoms due to sulfur dioxide exposure should also be excluded as irrelevant because she has failed to provide a

quantified assessment of Plaintiffs' risks of developing these symptoms and, thus, has failed to show that it is reasonably certain these symptoms will arise. *See FAG Bearings*, 846 F. Supp. at 1408; *Elam*, 765 S.W.2d at 208. Dr. Ryer-Powder estimates the amount of sulfur dioxide to which Plaintiffs were exposed and compares those amounts to exposure thresholds for certain health effects as summarized in ATSDR's 1998 Toxicological Profile for Sulfur Dioxide. However, she never estimates Plaintiffs' individual risks of developing those health effects. Thus, her opinions regarding Plaintiffs' risks of developing health effects due to sulfur dioxide are non-probative and, thus, irrelevant.

The same is true for Plaintiffs' claim for increased risk of cancer. In Missouri, "[a] claim for increased risk of cancer is simply an element of damages seeking compensation for future consequences of present damage. Like all other elements of damage in Missouri, future damages in a personal injury action are not compensable unless reasonably certain to occur." *FAG Bearings*, 846 F. Supp. at 1408 (internal marks omitted); *see also Lesch v. United States*, 612 F.3d 975, 982 (8th Cir. 2010). Therefore, a claim for increased risk of cancer is actionable only if "the toxic exposure has induced some biological manifestation from which the anticipated cancer is reasonably certain to occur—as quantified by expert testimony as a probability of occurrence greater than 50 percent." *Elam v. Alcolac, Inc.*, 765 S.W.2d 42, 208 (Mo. Ct. App. 1988). Plaintiffs cannot meet this burden, as Defendants explain in their summary judgment motion, filed concurrently herewith.

In this case, no Plaintiff has alleged any pre-cancerous condition or offered any evidence of "some biological manifestation from which the anticipated cancer is reasonably certain to occur." *Elam*, 765 S.W.2d at 208. Further, Dr. Ryer-Powder does not opine that any Plaintiff is more likely than not to develop cancer. Instead, according to her calculations, Plaintiffs' cancer

risks due to arsenic are, at most, 0.06 percent. Ex. E, Ryer-Powder 08/06/21 Add. at 7. In fact, Dr. Ryer-Powder admitted that she is not opining that there is a “reasonable certainty” that any Plaintiff will develop cancer. Ex. F, 4/5/19 Dep. at 131:14-20. Accordingly, no Plaintiff has stated an actionable claim based on allegations of an increased risk of cancer, and Dr. Ryer-Powder’s opinions on this matter are irrelevant. Thus, her opinions regarding Plaintiffs’ risks of developing cancer due to arsenic exposure do not “fit” the claim at issue and should be excluded.

D. Dr. Ryer-Powder’s opinions are inadmissible bolstering

Many of Dr. Ryer-Powder’s opinions are needlessly cumulative of and improperly bolster the opinions of other experts. *See Bavlsik v. Gen. Motors LLC*, No. 4:13-cv-509 DDN, 2015 WL 4920300, at *2 (E.D. Mo. Aug. 18, 2015) (“Finally, as with all evidence, an expert’s testimony [must not] needlessly presenting cumulative evidence.”); *In re RFC and RESCAP Liquidating Trust Action*, Case No. 0:13-cv-3451 (SRN/HB), No. 16-cv-4070 , 2020 WL 504661, at *3 (D. Minn. Jan. 31, 2020) (“[E]xpert may not offer opinions which serve no purpose other than to ‘bolster’ another expert’s opinions.”) (internal marks omitted).

Dr. Ryer-Powder relies on work of other experts that is demonstrably unreliable. She conducted a “Plaintiff-specific risk assessment ... using the modeled air concentrations for annual average arsenic concentrations ... provided by D. Sullivan.” Ex. A, Ryer-Powder Rep. at 32. The reliability of her model hinges on the reliability of his work. Similarly, to reach her opinion that Plaintiffs had high BLLs and that their exposures caused their alleged injuries, Dr. Ryer-Powder relies on the exposure estimates produced by Dr. MacIntosh. *Id.* at 19; Ex. F, 4/5/19 Dep. at 53:9-21. Dr. Ryer-Powder acknowledged that she did nothing to verify the Sullivan or MacIntosh opinions upon which she relied. However, Mr. Sullivan’s methodology for modeling air arsenic concentrations and Dr. MacIntosh’s modeling are both deeply flawed and unreliable, as Defendants demonstrate in the motions to exclude their testimony, filed concurrently herewith. To

the extent Dr. Ryer-Powder's opinions are based on the unreliable opinions of other experts, her opinions fail as well. *See Junk*, 628 F.3d at 449.

Moreover, Dr. Ryer-Powder's opinions regarding lead are cumulative of Dr. Bellinger's and Dr. MacIntosh's opinions and should thus be excluded. Dr. Ryer-Powder's opinions regarding the methods and impacts of lead exposure merely restate Dr. Bellinger's opinions without adding any new perspectives. *Compare* Ex. A, Ryer-Powder Rep. at 8 ("Lead is a toxic chemical, especially to children. No safe blood lead level has been identified.") *with* Ex. L, David Bellinger Report at 15 ("[Plaintiffs' alleged blood lead levels] is now considered to pose health risks to children, and, in fact, no concentration is considered to be 'safe.'"). Indeed, throughout her report, Dr. Ryer-Powder cites to Dr. Bellinger's work. *E.g.*, Ex. A, Ryer-Powder Rep. at 19–20. Similarly, Dr. Ryer-Powder repeats Dr. MacIntosh's opinions that Plaintiffs' exposure to lead contributed to each Plaintiff having BLLs above 10 µg/dL. *Compare* Ex. A, Ryer-Powder Rep. at 8 *with* Ex. M, David MacIntosh 6/10/19 Supplemental Report at 35 ("Each Plaintiff was exposed to lead at critical ages in their development that resulted in blood lead levels in excess of 10 micrograms per deciliter.").

IV. CONCLUSION

For the foregoing reasons, Defendants respectfully request that the Court exclude the testimony of Dr. Ryer-Powder in its entirety.

Respectfully submitted,

KING & SPALDING LLP

By: /s/ Geoffrey M. Drake

Andrew T. Bayman, #043342GA
abayman@kslaw.com
Carmen R. Toledo, #714096GA
ctoledo@kslaw.com
Geoffrey M. Drake, #229229GA
gdrake@kslaw.com
1180 Peachtree Street, N.E.
Suite 1600
Atlanta, Georgia 30309
Telephone: (404) 572-4600
Facsimile: (404) 572-5100

Tracie J. Renfroe, #16777000T
trenfroe@kslaw.com
Carol M. Wood, #2594581
cwood@kslaw.com
1100 Louisiana Street
Suite 4000
Houston, Texas 77002
Telephone: (713) 751-3200
Facsimile: (713) 751-3290

James P. Cusick, #4041653NY
jcusick@kslaw.com
1185 Avenue of the Americas, 34th Floor
New York, New York 10036
Telephone: (212) 556-2170
Facsimile: (212) 556-2222

*Attorneys for Defendants The Renco Group, Inc.,
D.R. Acquisition Corp., Doe Run Cayman Holdings,
LLC, Ira L. Rennert, The Doe Run Resources
Corporation, Theodore P. Fox, III, Marvin M.
Kaiser, Albert Bruce Neil, Jeffrey L. Zelms*

LEWIS RICE LLC

Andrew Rothschild, #23145MO
arothschild@lewisrice.com
Thomas P. Berra, Jr., #43399MO
tberra@lewisrice.com
Michael J. Hickey, #47136MO

DOWD BENNETT LLP

Edward L. Dowd, Jr. #28785MO
edowd@dowdbennett.com
Jeffrey R. Hoops, #69813MO
jhoops@dowdbennett.com
7733 Forsyth Blvd., Suite 1900

mhickey@lewisrice.com
600 Washington Ave., Suite 2500
St. Louis, MO 63102-2147
Telephone: (314) 444-7600
Facsimile: (314) 241-6056

*Attorneys for Defendants The Doe Run
Resources Corporation, Marvin K.
Kaiser, Albert Bruce Neil, Jeffery L.
Zelms, and Theodore P. Fox, III*

St. Louis, Missouri 63105
(314) 889-7300 (telephone)
(314) 863-2111 (facsimile)

*Attorneys for Defendants The Renco Group, Inc.,
DR Acquisition Corp., Ira L. Rennert, and Doe Run
Cayman Holdings, LLC*

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on this 15th day of November, 2021, a true and correct copy of the foregoing was filed with the Clerk of the Court through the Court's CM/ECF system, which will affect service on all counsel of record by sending a Notice of Electronic Filing.

/s/ Geoffrey M. Drake